ISIS - Feature #4100

A different formula for calculating the detector resolution for the Camera class has been added, and it needs to be integrated into the following applications.

2016-06-28 04:28 PM - Tyler Wilson

Status:	Acknowledged		
Priority:	Normal		
Assignee:			
Category:	Applications		
Target version:	3.4.12 (FY16 R2 2016-03-17 Mar)		
Impact:	Pixel resolution will be greatly improved for limb images. There should be no impact to ISIS, other than providing the user with a better approximation for the detector resolution.	**Software Version:**	

Description

This is the background:

The pixel resolution in the camera class does not compute an accurate pixel resolution other than at the sub-spacecraft lat/lon. The routine uses the proportion of

detectorSize / focalLength = groundPixelResolution / spacecraftAltitude

so

groundPixelResolution = spacecraftAltitude * detectorSize / focalLength

This does a poor job of approximating the pixel resolution at limbs or in the far range of wide angle cameras. A better approximation would be

groundPixelResolution = spacecraftAltitude * detectorSize / focalLength
groundPixelResolution = groundPixelResolution / cos (emissionAngle)

Of course this is not 100% accurate but is significantly better and is not too slow of an algorithm.

Obviously we have to decide how to deal with cos(emissionAngle) approaching zero. The other concern is how this will impact the iterative loops which converge on pixel resolution. Expect to see the truth data for many application and unit test to change slightly.

The status of things now:

The following functions using this new formula have been added to the Camera class:

- ObliqueDetectorResolution()
- ObliquePixelResolution()
- ObliqueLineResolution()
- ObliqueSampleResolution()

The output from these functions has already been added to

- mosrange
- campt
- camstats
- phocube

It needs to be added to:

- The advanced Track Tool: qnet/qview
- caminfo

It is important when testing this feature to consult with Tammy (tbecker@usgs.gov) or Lynn Weller (lweller@usgs.gov) before committing any changes, because the addition of this feature could negatively impact upon scripts they frequently run. Ideally if they have time, ask them to test your changes for you.

Related issues:

Copied from ISIS - Bug #476: Camera class does not compute pixel resolution a...	**Closed**

History

#1 - 2016-06-28 04:28 PM - Tyler Wilson

- Copied from Bug #476: Camera class does not compute pixel resolution accurately for limb images added

#2 - 2016-06-28 04:34 PM - Tyler Wilson

- Private changed from No to Yes

Tyler Wilson wrote:

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>
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> The output from these functions has already been added to
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> - campt
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> - phocube
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> It needs to be added to:
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> - caminfo
> - fx
>
> It is important when testing this feature to consult with Tammy (tbecker@usgs.gov) or Lynn Weller (lweller@usgs.gov) before committing any changes, because the addition of this feature could negatively impact upon scripts they frequently run. Ideally if they have time, ask them to test your changes for you.

#3 - 2016-06-28 04:35 PM - Tyler Wilson

- Private changed from Yes to No

#4 - 2016-06-28 04:36 PM - Tyler Wilson

- Description updated

#5 - 2016-06-28 04:53 PM - Tyler Wilson

- Assignee deleted (Tyler Wilson)

#6 - 2016-07-08 07:05 PM - Tammy Becker

- Status changed from New to Acknowledged

#7 - 2016-08-02 06:59 PM - Tammy Becker

Testing mosrange, campt, camstats, and phocube

/work/users/tbecker/IsisTesting/M00476_OliqueResolution